

What is claimed is:

1. An OFDM transmission device comprising:

N encoders for generating an OFDM signal of a frequency domain containing a predetermined number of symbols and having a data structure formed on a symbol basis for transmission;

N frequency converters for converting carrier frequencies of the OFDM signals of the frequency domains output from the respective encoders;

a multiplexer for generating multiplexed data by multiplexing the N OFDM signals of the frequency domains frequency-converted respectively by said N frequency converters in a direction of frequency;

an inverse Fourier transform section for generating the OFDM signal of a base band by performing an operation of inverse Fourier transform on said multiplexed data on a symbol by symbol basis;

an orthogonal modulator for orthogonally modulating said OFDM signal of the base band; and

a transmitter for converting the frequency of the orthogonally modulated OFDM signal into a signal of an RF band and transmitting said signal of the RF band;

each of said N encoders being adapted to synchronize the OFDM signals of frequency domains of the other encoders with a transmission frame to generate the OFDM signal of the frequency domain.

2. An OFDM transmission device comprising:

N encoders for generating an OFDM signal of a frequency domain to be transmitted through a predetermined information channel;

N frequency converters for converting carrier frequencies of the OFDM signals of the frequency domains output from each of said N encoders in accordance with the respective RF frequencies of said predetermined information channels;

a connecting multiplexer for generating connected and multiplexed data by multiplexing the N OFDM signals of the frequency domains frequency-converted respectively by said N frequency converters in the direction of frequency and connecting the multiplexed OFDM signals;

an inverse Fourier transform section for generating OFDM signals of base bands by performing an operation of inverse Fourier transform on said connected and multiplexed data on a symbol basis;

an orthogonal modulator for orthogonally modulating said OFDM signals of the base bands;

a transmitter for connected transmission of said OFDM signals of plurality of said information channels by frequency-converting the orthogonally modulated OFDM signals into a signal of an RF band; and

each of said N encoders being adapted to include information on the connected transmission indicating whether the OFDM signal to be transmitted

through the corresponding information channel is connected or unconnected to the OFDM signals to be transmitted through the other information channels in the OFDM signals before the connection.

3. The OFDM transmission device according to claim 2, wherein each of said encoders is adapted to generate an OFDM signal of a frequency domain by synchronizing the OFDM signals of other frequency domains and the transmission frames.

4. The OFDM transmission device according to claim 2, wherein each of said encoders is adapted to include information on the number of information channels to be connected and the positional information indicating the frequency position in the plurality of connected information channels as information on connected transmission in the OFDM signal before the connection.

5. The OFDM transmission device according to claim 2, wherein each of said encoders is adapted to define groups of a plurality of information channels to be connected and include in the OFDM signal the information on the groups connected for transmission indicating which group each information channel belongs to as the information on the connected transmission.

6. An OFDM transmission method comprising the steps of:
generating N OFDM signals of frequency domains synchronized mutually with transmission frames, each OFDM signal containing a predetermined

number of symbols and having a data structure formed on a symbol basis for transmission;

generating multiplexed data by frequency-converting each of the carrier frequencies of the generated N OFDM signals of the frequency domains and multiplexing the N OFDM signals of the frequency domains frequency-converted in a direction of frequency;

generating an OFDM signal of a base band by performing an operation of inverse Fourier transform on said multiplexed data on a symbol by symbol basis; and

orthogonally modulating said OFDM signal of the base band and converting the frequency of the orthogonally modulated OFDM signal into a signal of an RF band and transmitting said signal of the RF band.

7. An OFDM transmission method comprising the steps of:

generating an OFDM signal of a frequency domain to be transmitted through a predetermined information channel, including in the OFDM signal the information on a connected transmission indicating whether the OFDM signal to be transmitted through the corresponding information channel is connected or unconnected to the OFDM signals to be transmitted through the other information channels;

converting the carrier frequencies of the OFDM signals of the frequency domains in accordance with the respective RF frequencies of said

predetermined information channels and generating connected and multiplexed data by multiplexing the N OFDM signals of the frequency domains in the direction of frequency and connecting the multiplexed OFDM signals;

generating OFDM signals of base bands by performing an operation of inverse Fourier transform on said connected and multiplexed data on a symbol basis;

orthogonally modulating said OFDM signals of said base bands; and

performing a connected transmission of said OFDM signals of plurality of said information channels by frequency-converting the orthogonally modulated OFDM signals into a signal of an RF band.

8. The OFDM transmission method according to claim 7, wherein the OFDM signal of the frequency domain is generated by synchronizing the OFDM signals of other frequency domains and the transmission frames.

9. The OFDM transmission method according to claim 7, wherein information on the number of information channels to be connected and the positional information indicating the frequency position in the plurality of connected information channels are included as information on connected transmission in the OFDM signal before the connection.

10. The OFDM transmission method according to claim 7, wherein groups of a plurality of said information channels to be connected are defined and the information on the groups connected for transmission indicating which

group of each information channel belongs to is included as information on connected transmission in the OFDM signal before connection.